CONTRIBUTION TO RENAL AND URETERAL SURGERY.

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I. MULTIPLE URETERAL CALCULI COMPLICATED BY HYPOPLASIA OF OPPOSITE KIDNEY.

The following case is interesting, from first, the presence of an unusually large calculus in the vesical end of the right ureter, accompanied by a second calculus higher up on the same side which completely occluded this ureter. Second, a hypertrophy and septic condition of the right kidney whose ureter had been obstructed. Third, a hypoplasia of the opposite kidney. We thus have a congenital anomaly in the form of a hypoplasia of the left kidney associated with an acquired pathological condition in the shape of a right septic pyelonephritis in a hypertrophied organ.

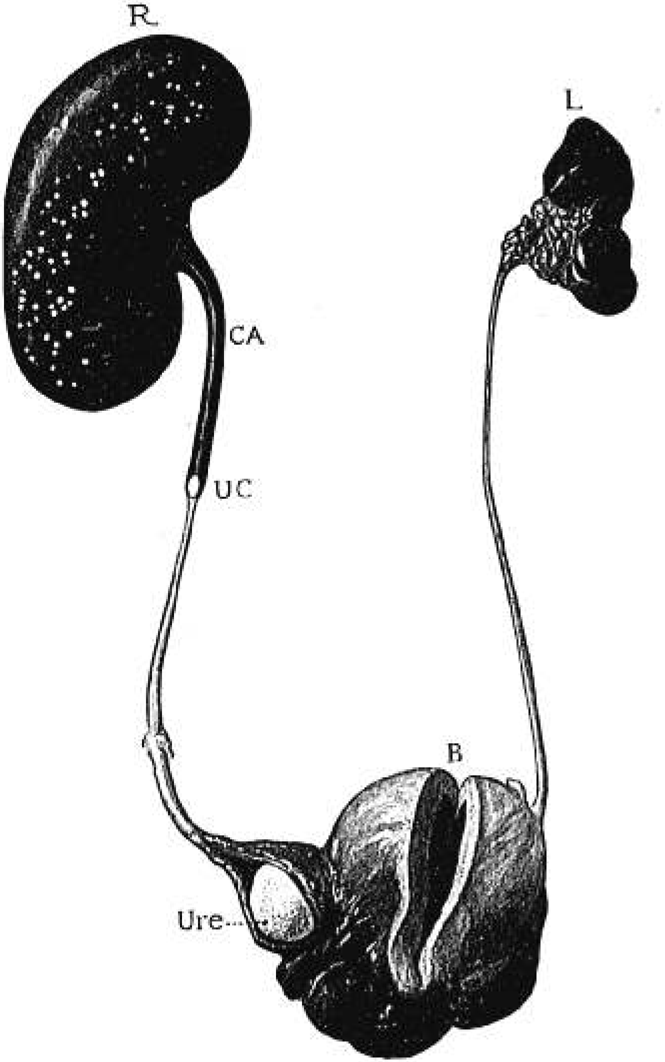
The case is particularly instructive because it shows that occasionally, all of the modern methods of exploring the genito-urinary organs, including cystoscopy, catheterization of the ureters, cryoscopic and other determinations of the separately collected urines may fail, be misleading and eventually may cause surgical interference of a contraindicated character.

In the case to be reported, that of a man about 35 years old, there was found on post-mortem examination a right septic kidney with calculi weighing 276 gms. One of the calculi was situated in the kidney, one in the upper part of the ureter and one in the latter, just before its entrance into the bladder. It was obvious from the size and the situation of the latter calculus, that it would have prevented successful catheterization of the right ureter. The left kidney while presenting some pathologic changes was found in a condition enabling it to still secrete a fairly normal urine free from pus, though perhaps containing some casts. But this kidney only weighed 39 gms. after having been preserved in Kaiserling's fluid, and undoubtedly somewhat less when first removed during the autopsy. On an average the adult male possesses about 320 gms. kidney-substance; the left kidney is generally somewhat (6–7 gms.) heavier than the right one. Upon removal of the right diseased kidney, in our case, 39 gms. of left kidney substance would not have been sufficient for the performance of the necessary urinary secretion.

The following is the clinical history of this case:

M. N., aged 34, clerk, was admitted to the Michael Reese Hospital to the service of Dr. Eisendrath on March 11, 1908, with the diagnosis of gall-stones. He had typhoid and pneumonia eight years before admission and had been under the care of a physician for five years for kidney trouble. He was taken sick three days before admission with pain in the right lumbar region and fever. These symptoms were accompanied by a gradually increasing stupor which changed to a coma shortly after admission. His temperature was 103, pulse 160, and respiration 40. The leucocyte count was 7000. Twenty ounces of urine were obtained by catheter during the first 30 hours. This urine contained 1 per cent. urea, a trace of albumin and a few white and red corpuscles, but was otherwise negative. Examination soon after admission showed marked rigidity over the entire abdomen, but most marked over the right upper quadrant. There was apparent tenderness over the area of rigidity, but this was also most marked over the gall-bladder region. This rigidity and tenderness varied greatly in intensity during repeated examinations, so that in the absence of any abdominal distention, of vomiting and the fact that the bowels moved after enemas, it was decided to wait before performing an exploratory laparotomy. During the first 24 hours the following additional symptoms presented themselves: the pulse became more rapid and weaker, rising to 180; he was deeply comatose, rigidity of the neck and arms became marked, a Kernig sign was distinct and there was slight opisthotonos. During the second 24 hours he passed 12 ounces of urine of the same quality as on the previous day. Physical

FIG. I.



Specimen removed at autopsy showing multiple calculi in right ureter. R. Greatly enlarged right kidney showing evidences of suppurative pyelonephritis. CA. Right ureter distended with blood and urine. UC. Ureteral calculus located just above a stricture of the ureter. Ure. Large facetted ureteral calculus located in distended vesical end of ureter. B. Bladder opened in median line. L. Undeveloped left kidney showing fœtal lobulations.

examination showed some dulness and bronchial breathing over the left lower lobe. The diagnosis of severe influenza with meningeal and pulmonary localization was made. The patient became deeply comatose and died on the third day after admission.

Report of Autopsy and Comments.—The brain shows an intense congestion of the entire pia-arachnoid. This membrane is dull, but there is no visible pus. The hemispheres show numerous minute hemorrhages. The ventricles contain an increased amount of fluid and the choroid plexus is congested.

Pericardium and heart, normal except that the left ventricle is somewhat hypertrophic and that the pericardial fat is quite abundant. The beginning of the aorta shows a few small slight elevated atheromatous spots. Coronary vessels normal. The left lung is adherent to the pleura costalis at the lower portion of the lower lobe. This lobe and part of the upper lobe are completely consolidated and pieces taken from these parts sink in water. On section the consolidated areas appear mottled. On the whole the color is dark brown-red, but there are grayish portions here and there. A thick purulent bloody fluid can be squeezed out from the consolidated portions. The right lung is full of air, crepitant throughout presenting in fact a slight degree of compensatory emphysema. In a few places on the dependent surfaces patches of hypostatic congestion are found. Otherwise the right lung is normal.

Spleen considerably enlarged, capsule smooth, dark purplish brown. On section trabeculæ distinct; follicles rather indistinct; pulp soft, easily scraped off.

Genito-urinary Organs.—The left kidney is very small, irregularly lobulated, on the whole about the fourth of the bulk of a normal kidney. It weighs after having been preserved in Kaiserling's fluid 39 Gms. On section, this small kidney shows no clear differentiation into cortex and medulla, its pelvis is very small; the left ureter about ½ the diameter of a normal one. Left kidney is surrounded by a mass of hypertrophic perinephritic fat. Right kidney is very large, measuring from pole to pole about 5.5 in. and transversely about the middle of the pelvis over 3 inches. It weighs, after having been preserved in Kaiserling's fluid, 276 Gms. It is dark purplish-pink in color. Capsule smooth and shining; little grayish-white patches from pinhead to millet-sized are seen throughout the capsule. On section the cortex is found to be widened, pyramids injected, renal tissue generally congested, tubules grayish-yellow, dull. Small grayish-white areas are found dispersed throughout the renal tissue. Near the upper pole at the junction of the medulla and the cortex a stone of the size of a cherry-stone is found lying free in a smooth-walled cavity. The pelvis of the right kidney is large and the first portion of the ureter is conically enlarged so that at its exit from the pelvis the base of the cone has two to three times the diameter of a normal ureter. About 3 to 4 inches downward a conical-shaped stone is wedged tolerably firmly in the ureter, obliterating it completely. Just below the point where this stone is situated, the ureter is somewhat constricted, lower down it is uniformly enlarged again, until it reaches the bladder. Before entering the bladder, the ureter forms an ampulla which contains a whitish, rather soft stone, the size of a large walnut. The bladder itself is rather large its walls markedly hypertrophied. Mucosa congested. Prostate normal. *Liver* slightly congested, otherwise normal; gall-bladder contains about 50 to 60 cc. of dark-green bile; no stones. Stomach and intestines negative.

Anatomical Diagnosis.—Acute congestion of pia-arachnoid. Adhesions at base of dura mater. Consolidation (red hepatization) of the left lung; congenital hypoplasia of the left kidney; multiple metastatic bacterial emboli of the right kidney; calculi in the right kidney and right ureter. Chronic cystitis. General septico pyæmia.

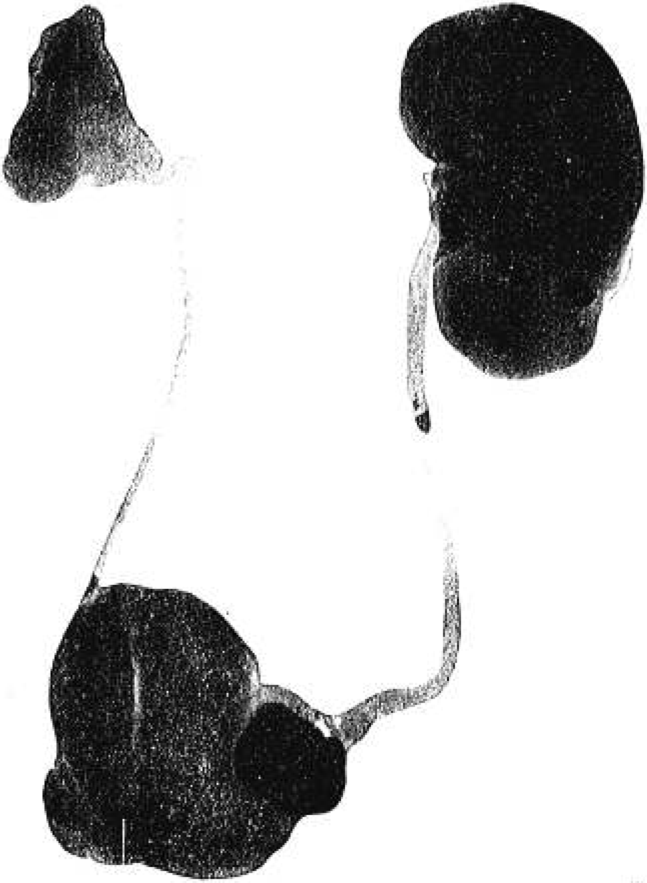
Chemical and microscopic examination of the large soft stone in the lower portion of the ureter shows that it is mostly composed of triple phosphate of calcium. Cultures made at the postmortem examination of the heart's blood and from the consolidated areas of the lung developed cocci and a small bacillus, the latter, however, not the bacillus of influenza.

Histological Examination.—Smears from the consolidated portion of the lung show desquamated alveolar epithelia, mono- and polynuclear leucocytes, erythrocytes, cocci and small bacilli.

Sections of the consolidated portions of the alveoli are filled with a cellular exudate composed of red and white blood-corpuscles and desquamated alveolar epithelia. The erythrocytes generally predominate. However, there are also some alveoli where the white corpuscles are much more numerous than the red ones. The inflammatory exudate in the alveoli contain many cocci, small and also large slender bacilli. The cocci are not of the type of the pneumococcus, but are staphylococci. In the interior of some of the red blood-corpuscles chromatophilic bodies are seen. Throughout the tissue of the *right kidney* are seen numerous foci with dense leucocytic infiltration and quite a few uriniferous tubules contain a purulent exudate. Cocci and bacilli are found both in the interstitial inflammatory foci as well as in the purulent material in the uriniferous tubules.

The small left kidney microscopically shows a differentiation into a cortex and a medulla which had not been distinctly visible on naked eye inspection. In the cortex are seen numerous glomeruli; some of them exhibit very marked thickening of the capsules of Bowman with beginning atrophy of the Malpighian tufts. Most of the glomeruli however are in a normal condition. Chronic interstitial changes are also seen in the medulla; here in some places the interstitial connective tissue between the tubules is markedly increased. On the whole, however, the interstitial changes are not very extensive. In other places both in the cortex and medulla small foci of mononuclear cells are observed, among the latter are likewise found quite a number of polynuclear eosino-

FIG. 2.



Skiagraph obtained by placing specimen shown in Fig. 1 upon an X-ray plate. The location of the ureteral calculus is well shown and the calculus located at the middle of the ureter is conical, its pointed end projecting into the stricture. Several calculi are seen in the parenchyma of the right kidney. The facetted nature of the lower ureteral calculus is well shown.

philes. The vessels of the small left kidney are generally congested. The epithelia lining the uriniferous tubules are generally fairly normal, while some show cloudy swelling. Hyaline casts are found here and there in the tubules. Bacteria could not be found in the sections of the left kidney, so it appears that it does not contain any bacterial foci which are so numerous in the large right kidney. Sections through the pia-arachnoid and the brain-tissue which show highly congested vessels likewise do not exhibit any bacterial invasion.

REMARKS.

1. It is rather unusual to have as large a ureteral calculus situated at the vesical end of the ureter as this case shows. The calculus was in reality double, the two being facetted.

2. The upper of the two ureteral calculi completely occludes the right ureter so that it is difficult to say whether the symptoms of this patient were due to calculous anuria or to the septic condition resulting from suppurative pyelonephritis, or, finally, whether the entire clinical picture was not due to a severe influenzal infection.

The presence of pneumonia and of the condition of the meninges rather speak for some general infection. From a surgical standpoint the case is especially interesting. The X-ray prior to any operation upon this patient would, of course, have shown two calculi. The case shows above all, the great necessity of making a careful determination of the functional capacity of the kidney before performing a nephrectomy.

2. RENAL LIPOMA, "*ex vacuo.*"

Lipoma of the kidney is quite rare and the renal tumors described as such are really to be divided into two separate groups, entirely different as to their etiology.

True lipomata of the kidney according to Borst (Die Lehre von den Geschwuelsten i, 141) are generally small, multiple, sharply defined, and situated subcapsularly or in the peripheral parts of the cortex, rarely in the medulla. They probably take their origin from misplaced embryonal inclusion derived from and cut off from the perirenal fatty tissue. Frequently these renal lipomata are found symmetrically in both kidneys. In consequence of atrophy of the renal tissue we encounter fatty tumors due to a considerable increase either of the fatty tissue at the hilus or of the perirenal adipose tissue. These hypertrophic lipomatous masses have been called, "lipome intranephritic" and "lipome perinephritic" by the French writers, and "kapsulære Lipome" by the Germans.

In some cases of this kind there is found in place of the kidney a lump of fat, having the shape of the kidney and still containing small remnants of kidney-tissue. The hypertrophy of the adipose tissue generally arises from a pelvis containing renal stones. Borst gives it as his opinion that in all cases of hypertrophy of the hilus and perirenal fat the atrophy of the kidney-substance is the primary factor and it is not the proliferation of the adipose tissue which secondarily leads to pressure atrophy of renal tissue.

The following is a case representing a lipoma of the second group, namely one which was due to hypertrophy of the adipose tissue; the hypertrophy following atrophy of the kidney-substance in consequence of stones and inflammatory processes of long standing. The clinical history of this case is as follows:

The patient was 28 years of age, a conductor by occupation, and admitted in October, 1906, to the service of Dr. Eisendrath, in Cook County Hospital. The patient had been operated upon 11 years before admission on account of perinephritic abscess, since which time a sinus had persisted over the left renal region. This sinus was located in the left postaxillary line about midway between the left last rib and the crest of the ilium. It was impossible to pass a sound further in than about 3 inches. Prior to the operation a ureteral catheterization was performed by Dr. Louis E. Schmidt, who found that urine which was entirely normal in character escaped from the right ureteral catheter, whereas it was impossible to pass a catheter for about one inch above the vesical end of the left ureter. An incision was made on the left parallel to the last rib and the kidney region explored. There were a number of dense adhesions around what seemed to be the kidney, but it was impossible to detect any kidney-substance proper. After extensive manipulation, it was possible to free

FIG. 3.

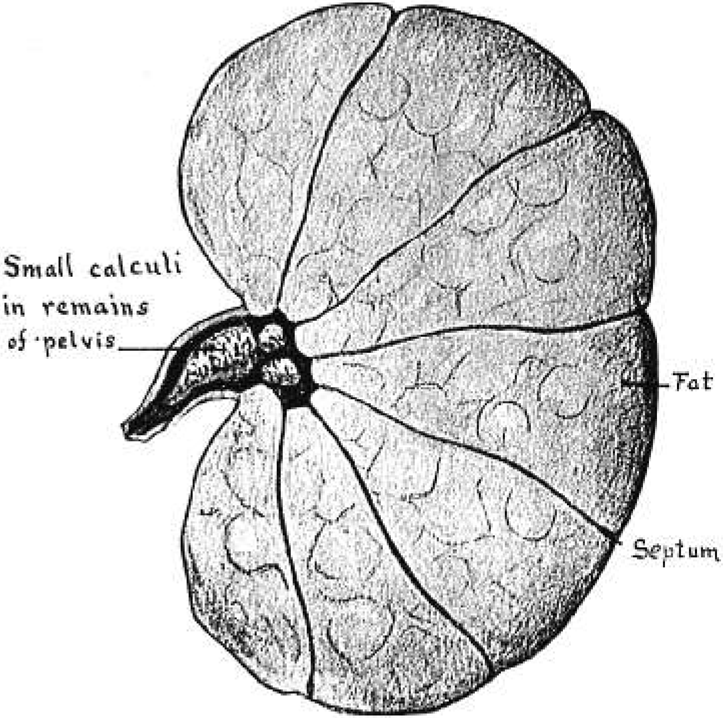


Illustration showing fatty transformation of kidney as a result of chronic suppuration following calculous pyelitis, etc.

what seemed to be a mass of fat, which had the shape of the kidney (Fig. 3), but was somewhat smaller than an adult fist. Further examination showed that this mass had the shape of the normal kidney and was located in the position of the latter. In the freed specimen it was possible to identify several septa between the lobules of fat which corresponded to the septa between the original lobules of the kidney. The sinus itself led through this mass of fat into a dilatation which corresponded to the pelvis of the kidney and contained several small calculi. It was not necessary to ligate any vessels of the pedicle.

Microscopic examination of the mass removed showed it to be composed of loose areolar connective tissue, the meshes being filled with fat. The septa noticeable on naked-eye inspection were composed of coarse, more or less hyaline connective-tissue fibres. No remnants of any kidney-substance could be found in any of the sections examined. Apparently the renal tissue had disappeared and had in the course of time been completely displaced by the lipomatous mass.

We are dealing in this case with the type called "lipome intranephritic" by the French writers, because the renal septa still present demonstrate that the lipomatous mass proliferated right inside of the disappearing kidney-substance. It was also impossible to demonstrate any kidney-substance left. In perinephritic lipoma (as seen in such a case by one of us) there is generally a small mass of atrophic renal substance left which is placed like a small cap on the upper pole of the lipoma.

3. RUPTURE OF THE KIDNEY (Fig. 4).

The following is an unusual case of rupture of the kidney, with subsequent infection and destruction of most of the mass of the injured kidney. A small remnant remaining continued to secrete a urinary fluid. This fact, however, is not at all surprising since we know quite well that parenchymatous organs even if their environments are changed or if transplanted keep on furnishing their normal secretions or excretions as long as they have a sufficient blood-supply and an adequate outlet for the products of their physiologic activity.

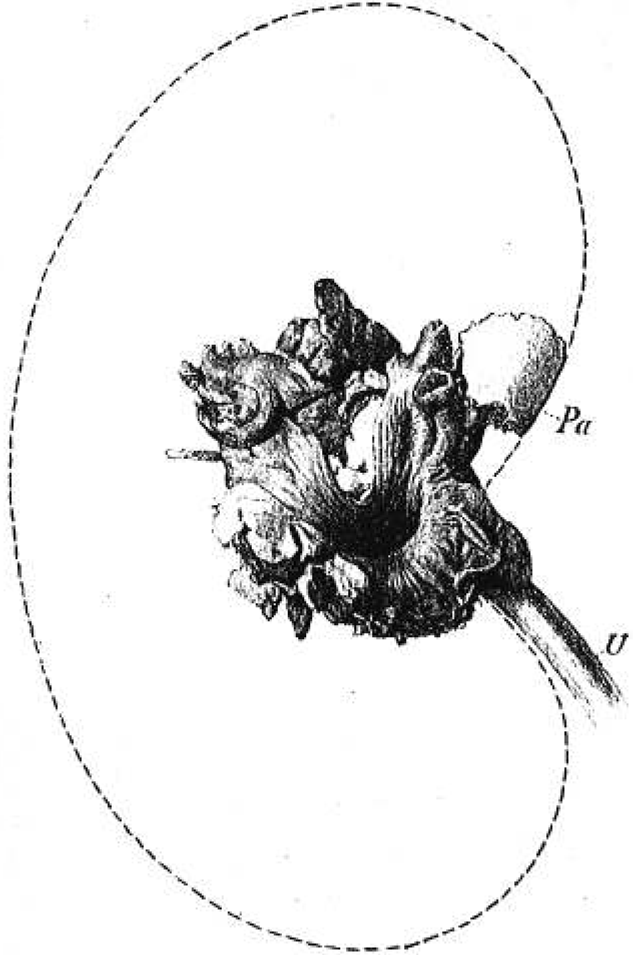
The clinical history of the case referred to is as follows:

The patient was admitted to the service of another surgeon in the Cook County Hospital, January, 1906. He had been on a protracted spree and could give no history of the manner in which he received his injuries. He complained of pain in the right side of the abdomen and there was tenderness on pressure in the right hypochondriac region. The urine contained a large amount of blood. There were no external signs of injury, but the patient was suffering considerable shock. On January 8 patient seemed to be in more pain than during previous days. There was a moderate amount of tympany and hæmaturia continued to quite a marked degree.

On January 9 an exploratory operation was performed and the kidney exposed. A moderate amount of urinary infiltration was found around the kidney and a drain was inserted down to the pelvis of the kidney. Blood persisted in large quantities in the urine for a number of days after this operation. He was admitted to the service of Dr. Eisendrath May 10, 1906, on account of a urinary fistula situated about one inch below the last left rib in the midaxillary line at the centre of the former nephrotomy incision. A bloody watery fluid escaped mixed with pus. A probe was passed into the fistula downwards and inwards for about four inches. The former incision was reopened under anæsthesia and the finger at once entered a cavity containing about eight ounces of turbid fluid evidently urine. Finger upon being inserted into this cavity entered at once a structure which was readily recognized by those who examined him as the hilus of the kidney with the area extending downwards and inwards from it. Examination of the cavity showed that there was a portion of the kidney-tissue left along its anterior surface about the size of a walnut.

The kidney itself had probably been destroyed by the original injury or disintegrated by the subsequent infection. There was left in addition to this small fragment of parenchyma only the pelvis and the area extending from it. (Fig. 4.) A sinus persisted for some months so that on July 20 it was necessary to reopen the wound and remove several small fragments of renal parenchyma which were adherent to the edge of the cavity and had evidently continued secreting. After this last operation patient made an uneventful recovery and wound healed.

FIG. 4.



Specimen from a case of complete rupture of the kidney Pa. Remains of parenchyma. U. Ureter with remnants of pelvis and chalices attached.